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ABSTRACT

The nature of the multiuser object oriented (MOO) environment lends itself to flexible and rich interactive collaboration space providing interactive discussion, mail, mailing list, and news features to its virtual denizens. EdMOO (HREF1) was created in mid-1995 as an environment for teachers to experience the text based virtual reality environment offered by a MOO and intended to provide an environment for discussing education and training issues, as well as to possibly be supported by an online document library. This paper describes the growth of EdMOO and its adoption of multimedia artifacts to enhance the communications within the MOO. The development of Drover software with programmed extensions to EdMOO permits participants in an online meeting to display documents, graphics, sounds, movies, and any of the other media supported by Netscape, to others in the same virtual place. Typical MOO problems that were evident in the initial EdMOO environment included: "noise" in a crowded room; problems for players being unable or reluctant to type in real time; and the need for powerful and flexible user tools. (Contains 13 references.) (Author/AEF)

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EdMOO : One Approach to a Multimedia Collaborative Environment

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EdMOO [HREF 1] was created in mid 1995 as an environment for teachers to experience the text based virtual reality environment offered by a MOO. It was intended to provide a place for discussing education and training issues, and possibly to be supported by an online document library. This paper describes the growth of EdMOO and its adoption of multimedia artifacts to enhance the communications within the MOO. The development of the Drover [HREF 2] software with programmed extensions to EdMOO permits participants in an online meeting to display documents, graphics, sounds, movies, in fact any of the media supported by Netscape, to others in the same virtual place.

Multiple User Object Oriented Dungeons (Domains) have some tradition in education and professional support. TECFAMoo [HREF 3] and BioMOO [HREF 4] being well known sites with primary interests in education for the former, and support of biological scientists for the latter. The EdMOO project began as a text based MOO for local teachers to use as a meeting place. Rather than make use of existing MOOs, this assumed that Australian teachers would be more inclined to adopt a new system where there was a strong likelihood that other participants were also novices, and whose motives for using the system were likely to be similar to their own. At the time of writing, a number of teachers from Victorian schools are being introduced to EdMOO, and their communications and constructions are to be studied. The research will document the development of the MOO itself, as well as the quality and style of communications with a focus upon the place as a system for professional development support.

It was (and still is) envisaged that the environment of EdMOO would be created and put into a state of frequent change by the participants, as their requirements and programming skills developed. Being realistic about the amount of time that teachers have available has meant a strong focus in the initial stages upon creating useful tools, manuals, and shortcuts.

The Monash Education EdMOO

Latt Epstein [HREF 5] indicates that the nature of the MOO environment lends itself to

> .. highly malleable and rich interactive collaboration space providing interactive(chat), store and forward(mail) as well as posting(mailing list) and news features to its virtual denizens, many of which have incorporated MOO into their daily routine...staying connected to friends, colleagues and other team members all day.

Various issues in the implementation of the "Text Based Virtual Reality" produce problems for the interactive players. These include difficulty in programming objects, and navigating the MOO. Not surprisingly, the development of the World Wide Web has inspired various MOO developers to look at ways of integrating the technologies for the benefit of MOO players. Work at E_MOO [HREF 6] has produced a WWW interface to the MOO, or a least the potential for this, by allowing the MOO server to distribute HTML documents (Web pages) on a separate port. Coppieters of BioMOO [HREF 7] recognises the communications and programming issues, but confirms the communication focus of the environment.

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> To use the MOO as simply a provider of web pages is a waste of one of this VR system's greatest strengths: live communication. Second, limitations in the current MOO servers make it difficult to automatically add web manipulation features to all MOO objects, and instead, such object manipulation must be custom designed for each object class. This is expected to be solved by the release of the LambdaMOO server version 1.8.0 sometime in the (hopefully near) future. Until then, most object manipulation is best performed via the telnet window.

Interestingly, similar observations have been made at EdMOO, however the importance of providing a simple and effective means for players to display and simultaneously view multimedia objects was considered paramount. EdMOO operates with rather limited resources. The BioMOO approach to objects presents a powerful interface whereby programmed objects in the MOO can be viewed using the object number. This is in the form http://bioinfo.weizmann.ac.il:8000/99anon/anonview/4715 [HREF 8] where "4715" is the object number of the room or object. This system permits a navigation and exploration of the MOO itself using the WWW browser.

EdMOO takes a rather different approach at the outset. Here we are concerned with players (teachers) being able to display images, sounds, documents which are relevant to the topic under discussion. EdMOO is not at present treating the WWW interface as a MOO navigational tool. Furthermore, it deliberately avoids automatically providing graphical or sound representations of objects as this might interfere with players' perceptions of the objects they encounter. To explain this, we might consider the coffee shop, which is a space within EdMOO. Adding multimedia functionality could have provided a graphical display of one person's image of this space. At present it is described in text only, and this is the desired behaviour since each player within the coffee shop will use that space in the context of their own interpretation of the text description.

> ..there are booths around the edge of the room, and small, round tables. An impressive espresso machine...[HREF 9]

Drover

The Drover software was developed quickly to experiment with this environment. Initially it was devised as an enhanced telnet program to assist navigation and programming in EdMOO. Once work had begun, it quickly developed into the form where it was able to interface with Netscape at least as far as forcing Netscape to load URLs. The screen picture indicates three groups of control buttons which perform the navigation, and various common MOO functions. Of particular note is the "N" button which causes the page loaded on the player's Netscape to be displayed to all other players in the room. Other buttons perform URL loading in combination with pull-down selection menus.

Most importantly, the objects being played or displayed need not exist on the local server, but may exist anywhere on the Internet as long as the players have access.

The ability to display objects is dependent upon player status and the "room" being used. For example, in three meeting rooms have been built, only registered players may display objects to other players. In EdMOO, rooms are programmed to allow the "showsite" command. Upon reception of the instruction, the Drover program on each player's computer will trigger Netscape to load the URL indicated. Other commands include "whispersite", whereby a player may cause a URL to load secretly on one other player's screen.

EdMOO in Use

The screen display below shows an example of Dover in use with EdMOO. In discussing the community of online quilters, three players were shown the page of "World's Worst Quilt". The image is typical of what an EdMOO player would have seen on their screen during this session. One window shows the telnet dialogue being displayed by the Drover software. The other window is Netscape having loaded the URL under discussion for all players in that room.

The Drover package adds multimedia functionality to EdMOO through its programmed interface with Netscape. Obviously, players using multimedia must have Netscape installed. At this level,

EdMOO adds to the communications artifacts which a teacher-player may call upon while interacting with others.

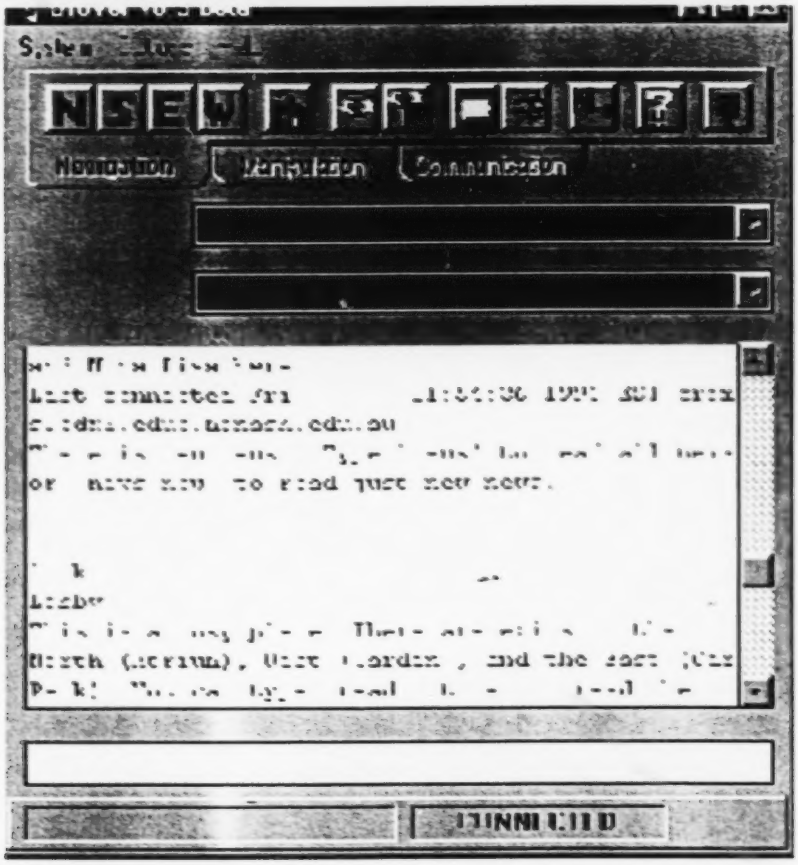

Figure 1: The Drover Software Screen

As with any LambdaMOO, EdMOO permits privileged players to create virtual objects in various spaces or rooms. The environment of EdMOO additionally allows programmed objects to perform URL loads at the player's workstation, or indeed at other players' workstations. As a simple example, in the Lobby, the command "look david" causes the MOO to respond text "It's the famous sculpture.", and simultaneously, Netscape loads a picture of that statue from a distant Web site. At the time of writing, a Jukebox in the Coffee Shop had been programmed to output various entertaining text messages in response to players' instructions. (Grover, Interaction in the Coffee Shop, 1996) [HREF 10]

Kick Jukebox
The Jukebox lights flicker on
Play Sgt Pepper's
The sounds of Sgt Pepper's fill the coffee shop

Code may be added to this object that would allow the Drover client to perform any number of Internet functions :

- Display a graphic from the local or a remote site;
- Play a sound file from the local or a remote site;
- Play a movie file from the local or a remote site;
- Download a file from anywhere; and
- Send Email to a specified user.

All of the above functions could be directed to the player who uses the object, to a specified other player, to all other players in the room, or indeed to other players in the MOO. Equally, the

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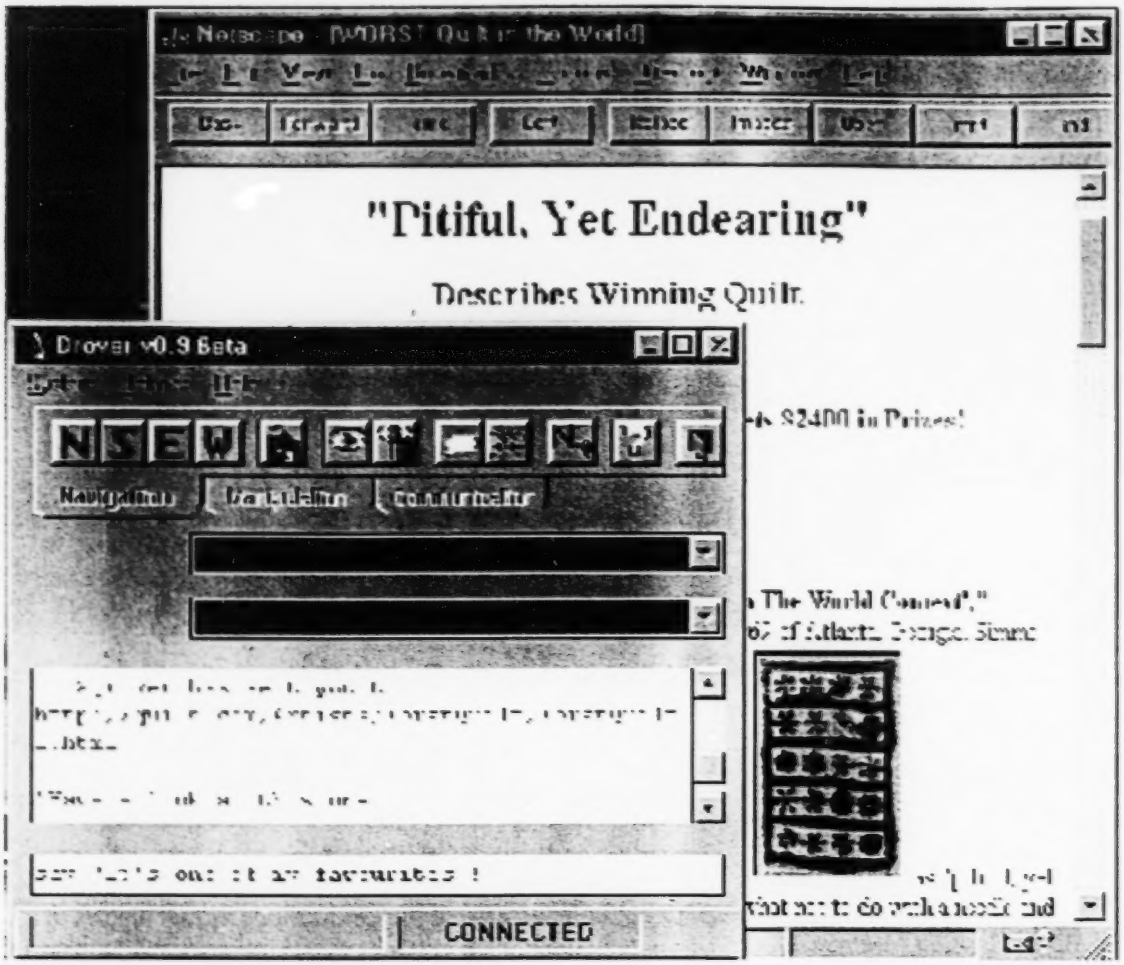
programmed objects could be established that would invoke PERL scripts to create or modify Web pages on various servers. The programmers admit that there are possibilities which they have yet to explore.



Problems in MOOspace

In building the initial EdMOO environment, some typical MOO problems became evident. Schweller [HREF 11] identifies some of these as follows :

- "Noise" in a crowded room;
- Problems for players being unable or reticent to type in real time; and
- The need for powerful and flexible user tools.

After the addition of the multimedia extensions to EdMOO, these three issues in particular became worse, and techniques to solve them were developed.

In meeting room one, which was envisaged as a conference venue, only one person at a time may display objects. This is designed to keep the noise level manageable, and one person in control of the multimedia displays. The analogy being used is that of the "talking stick". To be able to display a WWW site, document or other item to players in meeting room one, the person must be in possession of the talking stick. This is merely a programmed object which can be passed from player to player as required. Other rooms do not have such restrictions as yet.

Another difficulty which will be addressed is the potential for annoying behaviour of a player. Since the environment permits programmed and interactive control over all of Netscape's functions (at the time of writing), it would be possible for a player to attempt to send files from remote computers to the participating group without invitation. Similarly, players have been frustrated when

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a discussion involves movement of multimedia files too quickly to view in real time. Future versions of the software and programming modifications to EdMOO will attempt to rectify these difficulties.

Constructing the Player

MOOspace allows the player to "be" anyone they wish to be. EdMOO experience has already shown that players are willing to go online without identifying themselves. Since this MOO has been developed specifically for teachers to collaborate, and for teachers to conduct experiments with these spaces, there is at least potential for players to use the multimedia functions to enhance their constructions of themselves. This might of course result in a MOO population of super teachers, or indeed objects which respond to each other, and change their images as they interact. Much of the documentation process in this research concentrates upon players' constructions and constructions of themselves.

Some of the questions which will be addressed in the research include :

Is it possible to have a virtual meeting which is effective?

The fact that educators can participate in directed discussions from time to time regardless of their physical location suggests that the EdMOO might develop protocols for virtual meetings, and that new roles for meeting coordinators and attendees would arise. There is clear potential for programmed objects to enhance these interactions if the participants regard this as useful.

To what extent do casual interactions serve to assist the professional development of educators?

As a contrast to prearranged meetings, educators' casual use of spaces and objects in EdMOO will be documented to establish amongst other things, whether the formation of small and temporal groups takes place and creates some professional advantage.

Can electronic documents and multimedia objects be organised into useful collections through the collaborative environment of EdMOO?

With the potential for objects or rooms to invoke various Internet activities, such as the displaying of documents, sounds, and graphics, there may be some ways to use the MOO as an intelligent interface for educators to support others.

What aspects of the EdMOO environment show potential for direct instructional assistance?

Although beyond the scope of this paper, there have already been interesting developments in use of EdMOO to experiment with a particular kind of online teaching. This might be an additional indirect outcome for players (teachers) who develop considerable skills or interest.

Future work

Data collection will establish new directions, particularly in the sense of adding programming tools to assist players with their constructions, and possibly also to encourage their constructions. It is possible that navigational elements may be added to EdMOO to assist players in their visualisation of the space, but at the moment, this is not being pursued deliberately. It is believed that a move in this direction might interfere with the players' perceptions of various spaces and objects.. Further work with the Drover software is planned, although it is recognised that the current package has limitations, and should be regarded purely as a prototype.

References

Coppieters, K. *BioMOO's Web Interface*, http://bioinformatics.weizmann.ac.il/BioMOO/BioWeb (12 Jan 1996).

Schweller, K. *Building Tools for Education.* http://tecfa.unige.ch/edu-comp/DUJVRE/vol1/no1/building_tools_for_education.text (8 Jan 1996).

Hypertext References

HREF1

http://edx1.educ.monash.edu.au/projects/moo - The EdMOO home page.

HREF2

http://edx1.educ.monash.edu.au/projects/moo/drover.htm - The home page

for the Drover software.

HREF3
http://tecfa.unige.ch/edu-comp/WWW-VL/eduVR-page.html#Teaching - TECFAMoo

HREF4
http://bioinformatics.weizmann.ac.il/BioMOO - BioMOO

HREF5
http://tecfa.unige.ch/edu-comp/DUJVRE/vol1/no1/building_tools_for_education.text- MOO Tools for Education

HREF6
http://tecfa.unige.ch:4243/about_E_MOO - E_MOO

HREF7
http://bioinformatics.weizmann.ac.il/BioMOO/BioWeb - BioMOO's Web interface

HREF8
http://bioinfo.weizmann.ac.il:8000/99anon/anonview/4715 - A BioMOO object

HREF9
telnet edx2.educ.monash.edu.au 7777 - Description of the EdMOO Coffee Shop

HREF10
Grover. Interaction with the jukebox. Telnet edx2.educ.monash.edu.au 7777 (14 Jan 1996).

HREF11
http://tecfa.unige.ch/edu-comp/DUJVRE/vol1/no1/building_tools_for_education.text - Building tools for Education.